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(54) **METHOD AND APPARATUS FOR IMPLEMENTING NETWORK DEVICE FUNCTION OF WIRELESS COMMUNICATION TERMINAL**

VERFAHREN UND VORRICHTUNG ZUR IMPLEMENTIERUNG VON
NETZWERKGERÄTEFUNKTIONEN EINES DRAHTLOSEN KOMMUNIKATIONSENDGERÄTS

PROCÉDÉ ET APPAREIL ADAPTÉS POUR METTRE EN OEUVRE UNE FONCTION DE DISPOSITIF
DE RÉSEAU POUR UN TERMINAL DE COMMUNICATION SANS FIL

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EP 2 530 995 B1

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Description

TECHNICAL FIELD

[0001] The present disclosure relates to the field of communications, in particular to a method and an apparatus for implementing a network device function of a wireless communication terminal.

BACKGROUND

[0002] At present, with the rapid development of a 3G communication network, a user not only has a high requirement on a conventional voice service of a mobile network, but

also pays more and more attention to a wireless data service of the mobile network. Accordingly, a 3G data card is also very widely applied. A conventional data card exchanges data with a network in two states: one is that the data card is simulated into a modem, and the other is that the data card is simulated into a network device.

[0003] Due to the advantages of a network device in bandwidth and load, the second state, i.e., a data card is simulated into a network device, is becoming the mainstream use of the data card. However, now, such state is only available on the windows platform of the Microsoft corporation but unavailable on a non-windows platform, such as desktop Linux and embedded Linux. The reason is that the non-windows platform cannot provide a mechanism for exchanging network data with the data card.

[0004] CN 101630191A discloses a power-saving apparatus for universal serial bus (USB) modem equipment.

[0005] US 20060239266 A1 discloses a method for supporting wireless data services on a TE2 device using an IP-Based interface.

[0006] US 20100180063 A1 discloses a serial pass-through device.

SUMMARY

[0007] The technical problem to be solved by the disclosure is to provide a method and an apparatus for implementing a network device function of a wireless communication terminal, which can implement network data exchange with the wireless communication terminal on a non-windows platform. The problem is solved by the independent claims. Advantageous embodiments are defined by the dependent claims.

[0008] In one aspect, a method for implementing a network device function of a wireless communication terminal is provided, including:

receiving, by an apparatus for implementing the network device function of the wireless communication terminal, a socket request message which includes a control instruction and a sender of the control instruction; the apparatus for implementing the net-

work device function of the wireless communication terminal being located in a host, and the host being a non-windows computing platform;

parsing the received socket request message and determining the sender of the control instruction according to the sender included in the socket request message by the apparatus for implementing the network device function of the wireless communication terminal;

when the sender of the control instruction is the host, then encapsulating the received control instruction into an instruction format in a Qualcomm Modem Interface, QMI, specification and forwarding the encapsulated control instruction to the wireless communication terminal by the apparatus for implementing the network device function of the wireless communication terminal; and

when the sender of the control instruction is the wireless communication terminal, then encapsulating the received control instruction into the instruction format in the QMI specification and forwarding the encapsulated control instruction to the host by the apparatus for implementing the network device function of the wireless communication terminal.

[0009] In an example, the operation of forwarding the received control instruction to the wireless communication terminal by the apparatus for implementing the network device function of the wireless communication terminal may include:

sending the encapsulated control instruction to the wireless communication terminal by the apparatus for implementing the network device function of the wireless communication terminal through a first interface of the apparatus itself.

[0010] In an example, the operation of forwarding the received control instruction to the host by the apparatus for implementing the network device function of the wireless communication terminal may include:

sending the encapsulated control instruction to the host by the apparatus for implementing the network device function of the wireless communication terminal through a second interface of the apparatus itself.

[0011] An embodiment of the disclosure further provides an apparatus for implementing a network device function of a wireless communication terminal, located in a host, the host being a non-windows computing platform, the apparatus for implementing the network device function of a wireless communication terminal including an interface module and a processing module; the interface module is configured to receive a socket request message which includes a control instruction and a sender of the control instruction and send the socket request message to the processing module; and the processing module is configured to:

receive the socket request message sent by the interface module;

parse the received socket request message and determine the sender of the control instruction according to the sender included in the socket request message;

encapsulate the received control instruction into an instruction format in a Qualcomm Modem Interface, QMI, specification and forward the encapsulated control instruction to the wireless communication terminal through the interface module when the sender of the control instruction is the host; and

encapsulate the received control instruction into the instruction format in the QMI specification and forward the encapsulated control instruction to the host through the interface module when the sender of the control instruction is the wireless communication terminal.

[0012] The interface module may include:

a first interface module which is configured to forward a control signalling between the processing module and the wireless communication terminal; and
a second interface module which is configured to forward a control signalling between the processing module and the host.

[0013] The processing module may be specifically configured to send the encapsulated control instruction to the first interface module after determining that the sender of the control instruction is the host, so as to enable the first interface module to send the encapsulated control instruction to the wireless communication terminal; and send the encapsulated control instruction to the second interface module after determining that the sender of the control instruction is the wireless communication terminal, so as to enable the second interface module to send the encapsulated control instruction to the host..

[0014] The technical solution of the disclosure has the following beneficial effects:

In the above solution, the apparatus for implementing a network device function of a wireless communication terminal can implement the information exchange between the wireless communication terminal and a host on a non-windows platform, as a result, the problem that the network device function of the wireless communication terminal is not available on the non-windows platform is solved, and a user can freely use the network device function of the wireless communication terminal in different operating system environments.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015]

Fig. 1 is a diagram showing a flow of a method for implementing a network device function of a wireless

communication terminal in one embodiment of the disclosure;

Fig. 2 is a diagram showing the structure of an apparatus for implementing a network device function of a wireless communication terminal in one embodiment of the disclosure; and

Fig. 3 is a diagram showing another flow of a method for implementing a network device function of a wireless communication terminal in one embodiment of the disclosure.

DETAILED DESCRIPTION

[0016] For clearer description of the technical problem to be solved, technical solution and advantages of the embodiments of the disclosure, the disclosure will be described below in detail in conjunction with the drawings and embodiments.

[0017] To solve the problem that a non-windows platform cannot provide a mechanism for exchanging network data with a wireless communication terminal in the related art, the embodiments of the disclosure provides a method and an apparatus for implementing a network device function of a wireless communication terminal, which can implement the network data exchange with the wireless communication terminal on the non-windows platform.

[0018] Fig. 1 is a diagram showing a flow of a method for implementing a network device function of a wireless communication terminal in one embodiment of the disclosure, as shown in Fig. 1, the embodiment includes:

Step 101: an apparatus for implementing the network device function of the wireless communication terminal receives a control instruction and determines a sender of the control instruction.

Step 102: when the sender of the control instruction is a host, the apparatus for implementing the network device function of the wireless communication terminal forwards the received control instruction to the wireless communication terminal; and when the sender of the control instruction is the wireless communication terminal, the apparatus for implementing the network device function of the wireless communication terminal forwards the received control instruction to the host.

[0019] The method for implementing a network device function of a wireless communication terminal in the embodiment can implement the information exchange between the wireless communication terminal and the host on a non-windows platform, as a result, the problem that the network device function of the wireless communication terminal is not available on the non-windows platform is solved, and a user can freely use the network device

function of the wireless communication terminal in different operating system environments.

[0020] Fig. 2 is a diagram showing the structure of an apparatus for implementing a network device function of a wireless communication terminal in one embodiment of the disclosure, as shown in Fig. 2, the embodiment includes:

an interface module 20 which is configured to receive and send a control instruction; and

a processing module 21 which is configured to determine a sender of the control instruction received by the interface module 20; forward the received control instruction to the wireless communication terminal through the interface module 20 when the sender of the control instruction is a host; forward the received control instruction to the host through the interface module 20 when the sender of the control instruction is the wireless communication terminal.

[0021] The interface module 20 is specifically configured to receive a socket request message, which includes the control instruction and the sender of the control instruction; and

the processing module 21 is specifically configured to determine the sender of the control instruction according to the sender of the control instruction included in the socket request message.

[0022] The interface module 20 includes:

a first interface module 22 which is configured to forward a control signalling between the processing module and the wireless communication terminal; and

a second interface module 23 which is configured to forward control signalling between the processing module and the host.

[0023] The processing module 21 is further configured to encapsulate the control instruction received by the interface module 20 into a predetermined instruction format, wherein the predetermined instruction format includes but is not limited to: an instruction format in a communication-class sub-protocol in a Universal Serial Bus (USB) protocol, or an instruction format in a Qualcomm Modem Interface (QMI) specification.

[0024] The processing module 21 is specifically configured to send the encapsulated control instruction to the first interface module 22 after determining that the sender of the control instruction is the host, so that the first interface module 22 sends the encapsulated control instruction to the wireless communication terminal; and send the encapsulated control instruction to the second interface module 23 after determining that the sender of the control instruction is the wireless communication terminal, so that the second interface module 23 sends the

encapsulated control instruction to the host.

[0025] The apparatus for implementing a network device function of a wireless communication terminal in the embodiment can implement the information exchange between the wireless communication terminal and a host on a non-windows platform, as a result, the problem that the network device function of the wireless communication terminal is not available on the non-windows platform is solved, and a user can freely use the network device function of the wireless communication terminal in different operating system environments.

[0026] The method for implementing a network device function of a wireless communication terminal in one embodiment of the disclosure is further described below in conjunction with the apparatus for implementing the network device function of the wireless communication terminal in one embodiment of the disclosure and with the wireless communication terminal as a data card for example.

[0027] To implement the network data exchange with a data card on a non-windows platform, the firmware (on a device side) of the data card enumerates the data card as a composite apparatus in order that the data card has a network function device interface; and the firmware maps network function interface data of the data card, such as message data and frame data, to the network function interface. Thereafter, a virtual device driver of a kernel layer of a non-windows platform is developed to connect the firmware of the data card with an application layer program of the operating system of the non-windows platform, i.e., to realize the function of the first interface module of the apparatus for implementing the network device function of the data card in one embodiment of the disclosure; an application layer daemon program for the non-windows platform is developed to run all the time to receive and send the network data and state in real time, i.e., to realize the function of the processing module of the apparatus for implementing the network device function of the data card in one embodiment of the disclosure; an application layer function library (including network connecting, network disconnecting, parameter setting, state querying and other functions) for the non-windows platform is developed to be provided to an application program on a host side to operate various interfaces of the network device, i.e., to realize the function of the second interface module of the apparatus for implementing the network device function of the data card in one embodiment of the disclosure, and the application program on the host side can operate the network device provided by the data card through the interface functions provided by the application layer function library, wherein the operation includes but is not limited to network connecting, network disconnecting, network state querying, or the like. The first interface module is a direct link between the host and the data card, by which a network device control instruction and data on the host side can be sent to the data card, and data on the data card side can also be sent to the host side at the same

time, wherein these control instructions include but are not limited to the related instructions in the communication-class sub-protocol in the USB protocol, various instructions meeting the QMI specification, or the like. The processing module parses the received control instruction and encapsulates various control instructions and data, wherein these control instructions include but are not limited to the related instructions in the communication-class sub-protocol in the USB protocol, various instructions meeting the QMI specification, or the like. The instruction data from the processing module can be encapsulated through the second interface module into a packet format identifiable to the host, and provided to the application program on the host side, wherein these packet formats include but are not limited to the related instructions in the communication-class sub-protocol in the USB protocol, various instructions meeting the QMI specification, or the like; meanwhile, the data from the host is encapsulated and then provided to the processing module.

[0028] Fig. 3 is a diagram showing a flow of a method for implementing a network device function of a wireless communication terminal in one embodiment of the disclosure when the wireless communication terminal is a data card, as shown in Fig. 3, the embodiment includes:

Step 301: the processing module receives a socket request message;

specifically, after a system on the host side boots, the processing module judges whether a socket request message is received;

Step 302: the processing module determines the source of the socket request message; when the socket request message is sent from the second interface module, Step 303 is executed; and when the socket request message is sent from the first interface module, Step 304 is executed; when the socket request message which includes a control instruction and a sender of the control instruction is received, the source of the socket request message specifically can be determined based on the sender of the control instruction included in the socket request message.

Step 303: the processing module extracts the control instruction from the socket request message, and encapsulates the control instruction into a corresponding instruction format and then sends it to the first interface module;

when the socket request message is from the second interface module, it indicates that the socket request message is transmitted from the host side, which means that the host needs to send the control instruction to the data card; and the processing module extracts the control instruction from the socket request message, encapsulates it into a corresponding instruction format which includes but is not limited to

the related instructions in the communication-class sub-protocol in the USB protocol, various instructions meeting the QMI specification, or the like, and then sends the encapsulated control instruction to the first interface module in order to send it to the data card through the first interface module.

Step 304: the processing module extracts the control instruction from the socket request message, and encapsulates it into a corresponding instruction format and then sends it to the second interface module; when the socket request message is sent from the first interface module, it indicates that the socket request message is transmitted from the data card side, which means that the data card needs to send the control instruction to the host; and the processing module extracts the control instruction from the socket request message, encapsulates it in a corresponding instruction format which includes but is not limited to the related instructions in the communication-class sub-protocol in the USB protocol, various instructions meeting the QMI specification, or the like, and then sends the encapsulated control instruction to the second interface module in order to send it to the host through the second interface module. The second interface module can also encapsulate the control instruction to facilitate the calling by the host.

[0029] How to exchange a control instruction between a host and a data card on a non-windows platform has been described in detail in the above-mentioned steps, and a data exchange between the host and the data card can be transparently implemented through the first interface module, the processing module and the second interface module directly. The apparatus for implementing the network device function of the data card in one embodiment of the disclosure can implement an information exchange between the data card and the host on the non-windows platform, as a result, the problem that the network device function of the data card is not available on the non-windows platform is solved, and a user can freely use the network device function of the data card in different operating system environments.

[0030] The method embodiment corresponds to the apparatus embodiment, and those not described in detail in the method embodiment can refer to the related description in the apparatus embodiment, vice versa.

[0031] Those skilled in the art should understand that all or part of steps implementing the method in the above-mentioned embodiments can be completed by instructing related hardware by a program; the program can be stored in a computer readable storage medium, such as a disk, a compact disc, a Read-Only Memory (ROM) or a Random Access Memory (RAM); and the execution of the program includes the steps in the above-mentioned method embodiments.

[0032] What mentioned above are the preferred embodiments of the disclosure, and it should be explained

that various improvements or modifications can also be made by those skilled in the art within the principle of the disclosure and shall fall within the protection scope of the disclosure as defined by the appended claims.

Claims

1. A method for implementing a network device function of a wireless communication terminal, comprising:

receiving (101), by an apparatus for implementing the network device function of the wireless communication terminal, a socket request message which includes a control instruction and a sender of the control instruction; wherein the apparatus for implementing the network device function of the wireless communication terminal is located in a host, the host being a non-windows computing platform;

parsing the received socket request message and determining the sender of the control instruction according to the sender included in the socket request message by the apparatus for implementing the network device function of the wireless communication terminal;

(102) when the sender of the control instruction is the host, then encapsulating the received control instruction into an instruction format in a Qualcomm Modem Interface, QMI, specification and forwarding the encapsulated control instruction to the wireless communication terminal by the apparatus for implementing the network device function of the wireless communication terminal; and

when the sender of the control instruction is the wireless communication terminal, then encapsulating the received control instruction into the instruction format in the QMI specification and forwarding the encapsulated control instruction to the host by the apparatus for implementing the network device function of the wireless communication terminal.

2. The method for implementing a network device function of a wireless communication terminal according to claim 1, wherein forwarding the encapsulated control instruction to the wireless communication terminal by the apparatus for implementing the network device function of the wireless communication terminal comprises:

sending the encapsulated control instruction to the wireless communication terminal by the apparatus for implementing the network device function of the wireless communication terminal through a first interface of the apparatus itself.

3. The method for implementing a network device func-

tion of a wireless communication terminal according to claim 1, wherein forwarding the encapsulated control instruction to the host by the apparatus for implementing the network device function of the wireless communication terminal comprises:

sending the encapsulated control instruction to the host by the apparatus for implementing the network device function of the wireless communication terminal through a second interface of the apparatus itself.

4. An apparatus for implementing a network device function of a wireless communication terminal, located in a host, the host being a non-windows computing platform, wherein the apparatus for implementing the network device function of a wireless communication terminal comprises an interface module (20) and a processing module (21);

the interface module (20) is configured to receive a socket request message which includes a control instruction and a sender of the control instruction and send the socket request message to the processing module (21); and

the processing module (21) is configured to:

receive the socket request message sent by the interface module;

parse the received socket request message and determine the sender of the control instruction according to the sender included in the socket request message;

encapsulate the received control instruction into an instruction format in a Qualcomm Modem Interface, QMI, specification and forward the encapsulated control instruction to the wireless communication terminal through the interface module when the sender of the control instruction is the host; and

encapsulate the received control instruction into the instruction format in the QMI specification and forward the encapsulated control instruction to the host through the interface module when the sender of the control instruction is the wireless communication terminal.

5. The apparatus for implementing a network device function of a wireless communication terminal according to claim 4, wherein the interface module comprises:

a first interface module (22) which is configured to forward a control signalling between the processing module and the wireless communication terminal; and

a second interface module (23) which is configured to forward a control signalling between the processing module and the host.

6. The apparatus for implementing a network device function of a wireless communication terminal according to claim 5, wherein the processing module (21) is specifically configured to send the encapsulated control instruction to the first interface module (22) after determining that the sender of the control instruction is the host, so as to enable the first interface module to send the encapsulated control instruction to the wireless communication terminal; and send the encapsulated control instruction to the second interface module (23) after determining that the sender of the control instruction is the wireless communication terminal, so as to enable the second interface module to send the encapsulated control instruction to the host.

Patentansprüche

1. Verfahren zur Implementierung einer Netzwerkgerätfunktion eines drahtlosen Kommunikationsendgeräts, umfassend:

Empfangen (101), durch eine Vorrichtung zur Implementierung der Netzwerkgerätfunktion des drahtlosen Kommunikationsendgeräts, einer Socket-Anforderungsnachricht, die eine Steuerungsanweisung und einen Absender der Steuerungsanweisung umfasst; worin die Vorrichtung zur Implementierung der Netzwerkgerätfunktion des drahtlosen Kommunikationsendgeräts in einem Host angeordnet ist, wobei der Host eine Windows-fremde Rechnerplattform ist;

Parsen der empfangenen Socket-Anforderungsnachricht und Bestimmen des Absenders der Steuerungsanweisung nach dem Absender, der in der Socket-Anforderungsnachricht von der Vorrichtung zur Implementierung der Netzwerkgerätfunktion des drahtlosen Kommunikationsendgeräts umfasst ist;

(102) wenn der Absender der Steuerungsanweisung der Host ist, dann Einkapseln der empfangenen Steuerungsanweisung in ein Anweisungsformat in einer Qualcomm-Modem-Schnittstellen-, QMI, Spezifikation und Weiterleiten der eingekapselten Steuerungsanweisung an das drahtlose Kommunikationsendgerät durch die Vorrichtung zur Implementierung der Netzwerkgerätfunktion des drahtlosen Kommunikationsendgeräts; und

wenn der Absender der Steuerungsanweisung das drahtlose Kommunikationsendgerät ist, dann Einkapseln der empfangenen Steuerungsanweisung in das Anweisungsformat in der QMI-Spezifikation und Weiterleiten der eingekapselten Steuerungsanweisung an den Host durch die Vorrichtung zur Implementierung

der Netzwerkgerätfunktion des drahtlosen Kommunikationsendgeräts.

2. Verfahren zur Implementierung einer Netzwerkgerätfunktion eines drahtlosen Kommunikationsendgeräts nach Anspruch 1, worin das Weiterleiten der eingekapselten Steuerungsanweisung an das drahtlose Kommunikationsendgerät durch die Vorrichtung zur Implementierung der Netzwerkgerätfunktion des drahtlosen Kommunikationsendgeräts umfasst:

Senden der eingekapselten Steuerungsanweisung an das drahtlose Kommunikationsendgerät durch die Vorrichtung zur Implementierung der Netzwerkgerätfunktion des drahtlosen Kommunikationsendgeräts über eine erste Schnittstelle der Vorrichtung selbst.

3. Verfahren zur Implementierung einer Netzwerkgerätfunktion eines drahtlosen Kommunikationsendgeräts nach Anspruch 1, worin das Weiterleiten der eingekapselten Steuerungsanweisung an den Host durch die Vorrichtung zur Implementierung der Netzwerkgerätfunktion des drahtlosen Kommunikationsendgeräts umfasst:

Senden der eingekapselten Steuerungsanweisung an den Host durch die Vorrichtung zur Implementierung der Netzwerkgerätfunktion des drahtlosen Kommunikationsendgeräts über eine zweite Schnittstelle der Vorrichtung selbst.

4. Vorrichtung zur Implementierung einer Netzwerkgerätfunktion eines drahtlosen Kommunikationsendgeräts, die in einem Host angeordnet ist, wobei der Host eine Windows-fremde Rechnerplattform ist, worin die Vorrichtung zur Implementierung der Netzwerkgerätfunktion eines drahtlosen Kommunikationsendgeräts ein Schnittstellenmodul (20) und ein Verarbeitungsmodul (21) umfasst;

das Schnittstellenmodul (20) ist dafür ausgelegt, eine Socket-Anforderungsnachricht zu empfangen, die eine Steuerungsanweisung und einen Absender der Steuerungsanweisung umfasst, und die Socket-Anforderungsnachricht an das Verarbeitungsmodul (21) zu senden; und

das Verarbeitungsmodul (21) ist dafür ausgelegt:

die Socket-Anforderungsnachricht zu empfangen, die vom Schnittstellenmodul gesandt wird; die empfangene Socket-Anforderungsnachricht zu parsen und den Absender der Steuerungsanweisung nach dem Absender zu bestimmen, der in der Socket-Anforderungsnachricht umfasst ist;

die empfangene Steuerungsanweisung in ein Anweisungsformat in einer Qualcomm-Modem-Schnittstellen-, QMI, Spezifikation einzukapseln und die eingekapselte Steuerungsanweisung

- an das drahtlose Kommunikationsendgerät über das Schnittstellenmodul weiterzuleiten, wenn der Absender der Steuerungsanweisung der Host ist; und
 die empfangene Steuerungsanweisung in das Anweisungsformat in der QMI-Spezifikation einzukapseln und die eingekapselte Steuerungsanweisung an den Host über das Schnittstellenmodul weiterzuleiten, wenn der Absender der Steuerungsanweisung das drahtlose Kommunikationsendgerät ist. 5 10
5. Vorrichtung zur Implementierung einer Netzwerkgerätefunktion eines drahtlosen Kommunikationsendgeräts nach Anspruch 4, worin das Schnittstellenmodul umfasst: 15
- ein erstes Schnittstellenmodul (22), das dafür ausgelegt ist, eine Steuerungssignalisierung zwischen dem Verarbeitungsmodul und dem drahtlosen Kommunikationsendgerät weiterzuleiten; und 20
- ein zweites Schnittstellenmodul (23), das dafür ausgelegt ist, eine Steuerungssignalisierung zwischen dem Verarbeitungsmodul und dem Host weiterzuleiten. 25
6. Vorrichtung zur Implementierung einer Netzwerkgerätefunktion eines drahtlosen Kommunikationsendgeräts nach Anspruch 5, worin 30
- das Verarbeitungsmodul (21) speziell dafür ausgelegt ist, die eingekapselte Steuerungsanweisung an das erste Schnittstellenmodul (22) zu senden, nachdem bestimmt worden ist, dass der Absender der Steuerungsanweisung der Host ist, so dass es dem ersten Schnittstellenmodul ermöglicht wird, die eingekapselte Steuerungsanweisung an das drahtlose Kommunikationsendgerät zu senden; und die eingekapselte Steuerungsanweisung an das zweite Schnittstellenmodul (23) zu senden, nachdem bestimmt worden ist, dass der Absender der Steuerungsanweisung das drahtlose Kommunikationsendgerät ist, so dass es dem zweiten Schnittstellenmodul ermöglicht wird, die eingekapselte Steuerungsanweisung an den Host zu senden. 35 40 45

Revendications

1. Méthode pour mettre en œuvre une fonction de dispositif de réseau d'un terminal de communication sans fil, comprenant : 50
- la réception (101), par un appareil pour mettre en œuvre la fonction de dispositif de réseau du terminal de communication sans fil, d'un message de demande de socket qui comprend une instruction de commande et un expéditeur de 55

l'instruction de commande ; où l'appareil pour la mise en œuvre de la fonction de dispositif de réseau du terminal de communication sans fil est situé dans un hôte, l'hôte étant une plateforme informatique sans fenêtres ;
 l'analyse du message de demande de socket reçu et la détermination de l'expéditeur de l'instruction de commande selon l'expéditeur inclus dans le message de demande de socket par l'appareil pour mettre en œuvre la fonction de dispositif de réseau du terminal de communication sans fil ;
 (102) lorsque l'expéditeur de l'instruction de commande est l'hôte, l'encapsulation de l'instruction de commande reçue dans un format d'instruction dans une spécification Qualcomm Modem Interface, QMI, et le transfert de l'instruction de commande encapsulée au terminal de communication sans fil par l'appareil pour la mise en œuvre de la fonction de dispositif de réseau du terminal de communication sans fil ;
 et
 lorsque l'expéditeur de l'instruction de commande est le terminal de communication sans fil, l'encapsulation de l'instruction de commande reçue dans le format d'instruction dans la spécification QMI, et le transfert de l'instruction de commande encapsulée à l'hôte par l'appareil pour la mise en œuvre de la fonction de dispositif de réseau du terminal de communication sans fil.

2. Méthode pour mettre en œuvre une fonction de dispositif de réseau d'un terminal de communication sans fil selon la revendication 1, où le transfert de l'instruction de commande encapsulée vers le terminal de communication sans fil par l'appareil pour mettre en œuvre la fonction de dispositif de réseau du terminal de communication sans fil comprend :
 l'envoi de l'instruction de commande encapsulée au terminal de communication sans fil par l'appareil pour mettre en œuvre la fonction de dispositif de réseau du terminal de communication sans fil par l'intermédiaire d'une première interface de l'appareil lui-même.
3. Méthode pour mettre en œuvre une fonction de dispositif de réseau d'un terminal de communication sans fil selon la revendication 1, où le transfert de l'instruction de commande encapsulée vers l'hôte par l'appareil pour mettre en œuvre la fonction de dispositif de réseau du terminal de communication sans fil comprend :
 l'envoi de l'instruction de commande encapsulée à l'hôte par l'appareil pour mettre en œuvre la fonction de dispositif de réseau du terminal de communication sans fil par l'intermédiaire d'une deuxième interface de l'appareil lui-même.

4. Appareil pour mettre en œuvre une fonction de dispositif de réseau d'un terminal de communication sans fil, situé dans un hôte, l'hôte étant une plateforme informatique sans fenêtres, où l'appareil pour mettre en œuvre la fonction de dispositif de réseau d'un terminal de communication sans fil comprend un module d'interface (20) et un module de traitement (21) ;
le module d'interface (20) est configuré pour recevoir un message de demande de socket qui comprend une instruction de commande et un expéditeur de l'instruction de commande et pour envoyer le message de demande de socket au module de traitement (21) ; et
le module de traitement (21) est configuré pour :

recevoir le message de demande de socket envoyé par le module d'interface ;
analyser le message de demande de socket reçu et déterminer l'expéditeur de l'instruction de commande en fonction de l'expéditeur inclus dans le message de demande de socket ;
encapsuler l'instruction de commande reçue dans un format d'instruction dans une spécification Qualcomm Modem Interface, QMI, et transférer l'instruction de communication encapsulée au terminal de communication sans fil par l'intermédiaire du module d'interface lorsque l'expéditeur de l'instruction de commande est l'hôte ; et
encapsuler l'instruction de commande reçue dans le format d'instruction dans la spécification QMI et transférer l'instruction de communication encapsulée à l'hôte par l'intermédiaire du module d'interface lorsque l'expéditeur de l'instruction de commande est le terminal de communication sans fil.

5. Appareil pour mettre en œuvre une fonction de dispositif de réseau d'un terminal de communication sans fil selon la revendication 4, où le module d'interface comprend :

un premier module d'interface (22) qui est configuré pour transférer une signalisation de commande entre le module de traitement et le terminal de communication sans fil ; et
un deuxième module d'interface (23) qui est configuré pour transférer une signalisation de commande entre le module de traitement et l'hôte.

6. Appareil pour mettre en œuvre une fonction de dispositif de réseau d'un terminal de communication sans fil selon la revendication 5, où le module de traitement (21) est spécifiquement configuré pour envoyer l'instruction de commande encapsulée au premier module d'interface (22) après avoir détermi-

né que l'expéditeur de l'instruction de commande est l'hôte, de manière à permettre au premier module d'interface d'envoyer l'instruction de commande encapsulée au terminal de communication sans fil ; et pour envoyer l'instruction de commande encapsulée au deuxième module d'interface (23) après avoir déterminé que l'expéditeur de l'instruction de commande est le terminal de communication sans fil, de manière à permettre au deuxième module d'interface d'envoyer l'instruction de commande encapsulée à l'hôte.

Fig. 1

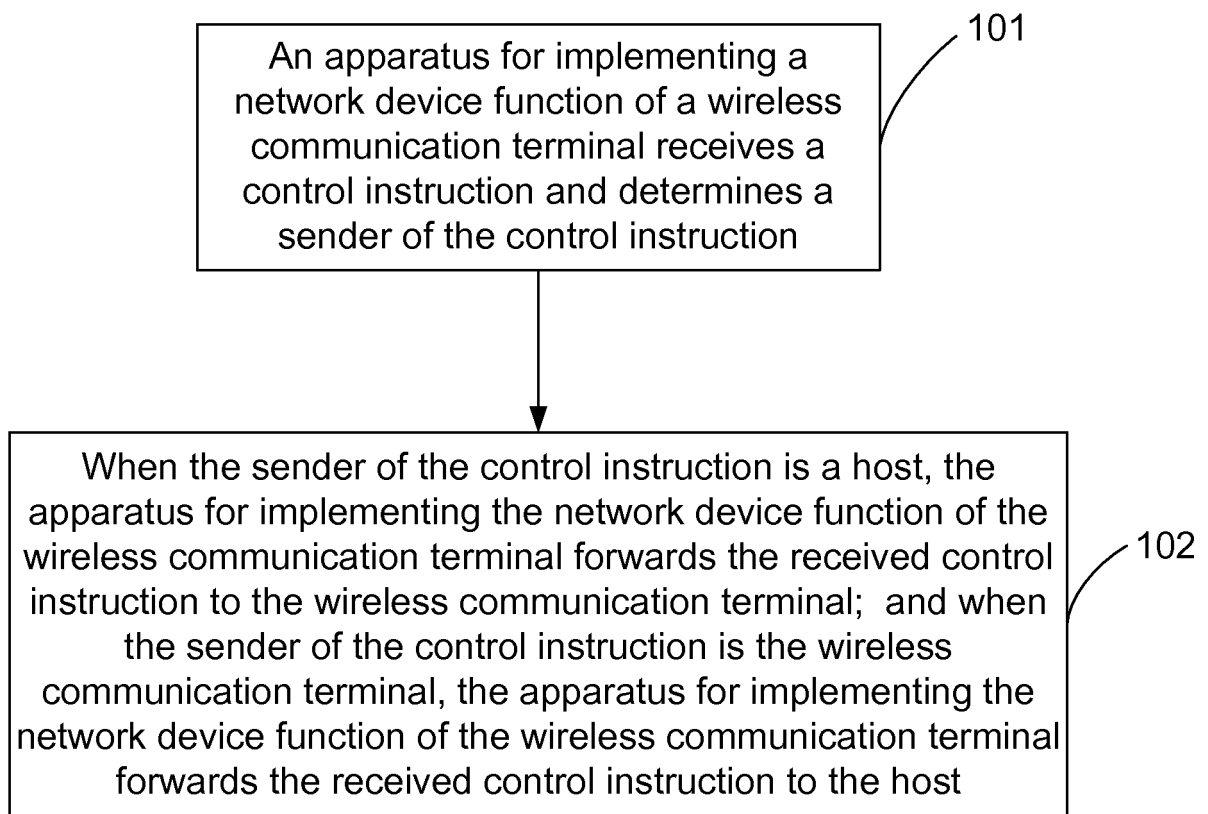


Fig. 2

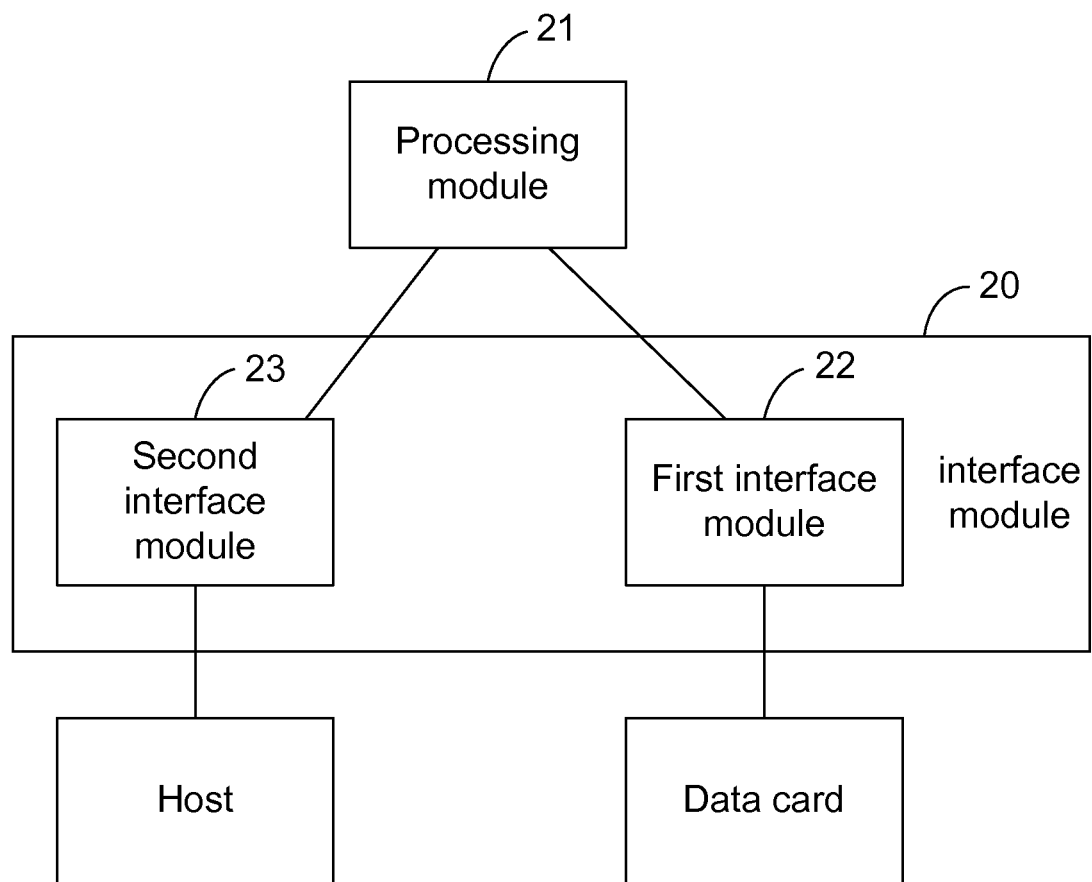
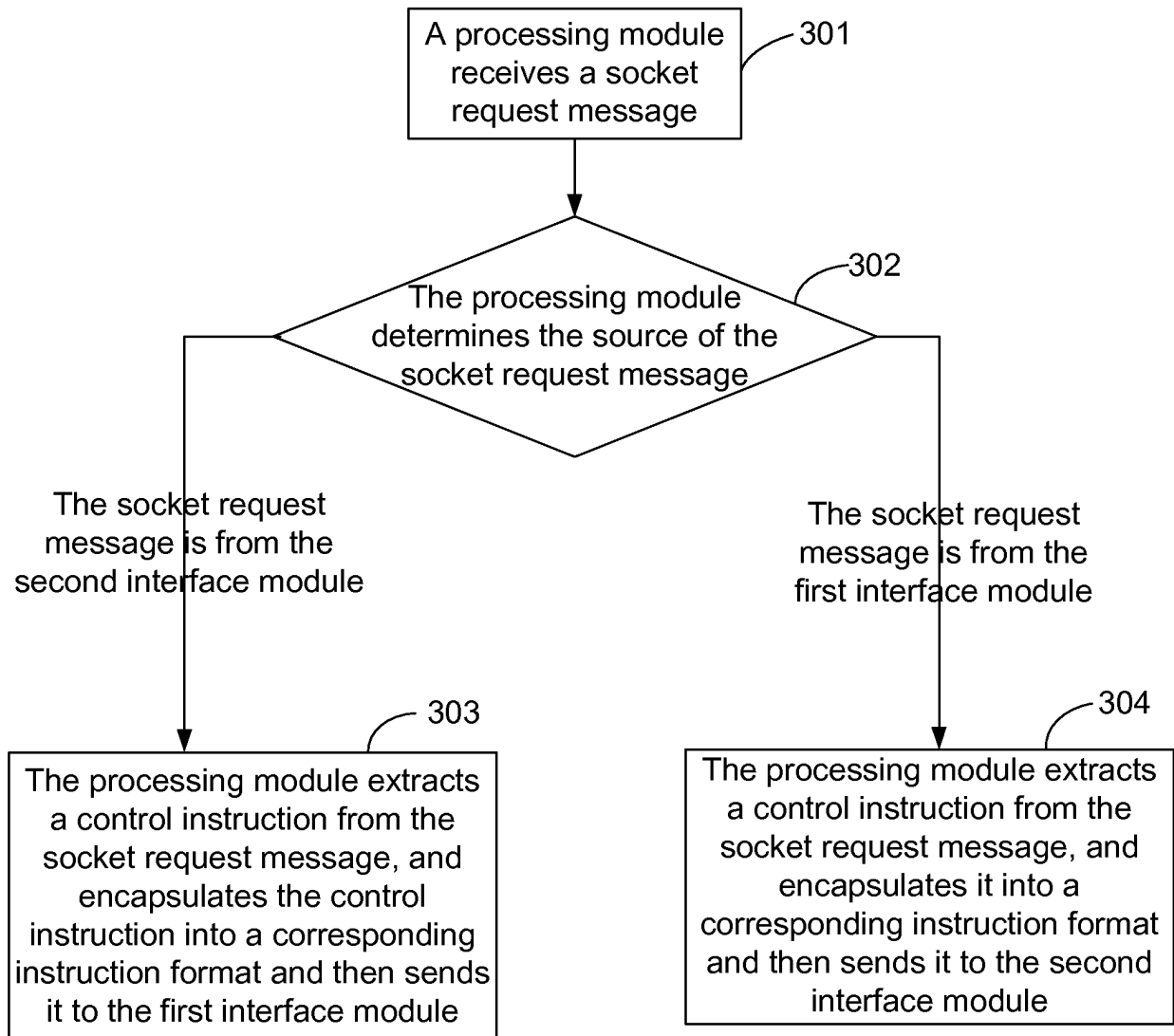


Fig. 3



REFERENCES CITED IN THE DESCRIPTION

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